

Recommendation 12-5R1

LIMITATIONS ON EARTH-SPACE LINK POWER LEVELS¹

The SFCG,

CONSIDERING

- a) that occupation of frequency bands used by space agencies is increasing rapidly;
- b) that in many cases the same frequency will be shared by several spacecraft;
- c) that the 2025 - 2110 MHz band is also shared with space-to-space links from data relay satellites to user satellites, which are limited to relatively small power levels by the provisions of RR 2557 and are consequently particularly susceptible to interference;
- d) that excessive EIRP from earth stations will make intra-service frequency sharing increasingly difficult and result in an inefficient use of the radio frequency spectrum;
- e) that excessive EIRP from earth stations likewise unnecessarily complicates the coordination with terrestrial services and may increase in some cases the coordination area;
- f) that the required EIRP from an earth station is determined by P_c/N_o , E_b/N_o , and the minimum signal level required by the spacecraft receiver;

RECOMMENDS

- 1. that space agencies limit the EIRP on Earth-to-space links to that required for safe spacecraft operation, by means of one or several of the following:
 - avoid, whenever practicable, using high power transmitters having a fixed output but instead adjust the transmitted power to the minimum needed to meet project requirements;
 - obtain the required EIRP by using reasonable antenna diameter in order to reduce both sidelobe radiation and transmitter power (Guideline: antenna diameter/rf wavelength equal to or greater than 70);

¹ CCSDS has adopted a similar recommendation (CCSDS401(3.2.1.)B-1).

- make compliance with REC ITU-R SA.509 a requirement in antenna specifications;
2. that spacecraft equipment designers endeavour to provide similar margins with regard to minimum P_c/N_o , minimum E_b/N_o and the minimum signal required by the spacecraft receiver.